Wisconsin
Department of Commerce

Evaluation # 200271-A

Safety & Buildings Division
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Wisconsin
Alternate Standard Evaluation

Standard	ANSI/ASAE EP486.1 OCT00 for Shallow Post Foundation Design and Allowable Soil Pressures
Proponent	Wisconsin Frame Builders Association PO Box 108 Iola, WI 54945-0108

SCOPE OF EVALUATION

The alternate standard, ANSI/ASAE EP486.1 OCT00, for shallow post foundation design has been evaluated for compliance with certain structural requirements of the current **Wisconsin Commercial Building Code (WCBC)**, **Chapters Comm 61-65.** Pursuant to s. Comm 61.61 the alternate standard is approved for use in the State of Wisconsin to satisfy the intent and the allowable load bearing values of soils of **IBC Section 1804** and acceptable standard of design in **IBC Section 2306.1**.

This evaluation does not include the review for compliance to provisions of the current **Wisconsin Commercial Building Code (WCBC)**, other than those specifically referenced above.

The use of this alternate standard is subject to the limitations and conditions described in this evaluation.

DESCRIPTION AND USE

The alternate standard, ANSI/ASAE EP486.1 OCT00, sets forth an acceptable design procedure for shallow post foundations. Included in this standard is a table (Table 1) that lists presumed soil properties for post foundation design and design methodology for resisting frost heaving and determining lateral and vertical loads of post foundations.

The standard may be used in its entirety with the exception of the limitations regarding Table 1 as set forth in limitations/conditions section of this evaluation. For the convenience of the user of this evaluation following is a reprint of the Table 1 of the standard, ANSI/ASAE EP486.1 OCT00.

Table 1 – Presumed soil properties for post foundations design (for use in absence of codes or tests)

Class of materials		Density or consistency[1]	Lateral pressure per unit depth[2], S		Lateral sliding coefficient[3], k_{cs}	Vertical Pressure[4], S_v		Friction angle[5], ϕ	Density[6], w		Estimated Constant of Lateral Soil Reaction[8], n_h	
			kPa/m	lb/ft^2-ft		kPa	lb/ft^2	degree	kg/m^3	lb/ft^3	kPa/m^2	lb/ft^4
1.	Massive crystalline bedrock	--	180	1200	0.79	200	4000	--	--	--	--	--
2.	Sedimentary and foliated rock	--	60	400	0.35	100	2000	--	--	--	--	--
3.	Sandy Gravel and/or gravel (GW and GP)	firm	45	300	--	--	--	38	2000	120	6285	40000
		loose	30	200	0.35	100	2000	32	1500	90	1570	10000
4.	Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM and GC)	firm	30	200	--	--	--	30	1750	105	1570	10000
		loose	22.5	150	0.25	75	1500	26	1400	85	1180	7500
5.	Clay, sandy clay, silty clay and clayey silt (CL, ML, MH and CH)	medium	20	130	6(130)[7]	--	--	15	2000	120	785	5000
		soft	15	100	--	50	1000	10	1500	90	160	1000

[1] Firm consistency of class 4 and the medium consistency of class 5 can be molded by strong finger pressure, and the firm consistency of class 3 is too compact to be excavated with a shovel.
[2] The hydrostatic increase in lateral pressure per unit depth has been included in the equations of this Engineering Practice. Source: Table 18-1-A UBC modified with the addition of firm and medium values from Hough.
[3] Sliding resistances source: Table 18-1-A UBC.
[4] Allowable foundation pressures are for footings at least 300 mm (1 ft) side and 300 mm (1 ft) deep into natural grade. Pressure may be increased 20% for each additional 300 mm (1 ft) of width and/or depth to a maximum of three times the tabulated value. Source: Table 18-1-A UBC.
[5] Soil friction angle varies from soft to medium density for clay materials, and from loose to firm for sand and gravel materials. Source: Hough.
[6] Soil density varies from soft to medium density for clay materials, and from loose to firm for sand and gravel materials. Source: Hough.
[7] Multiply an assumed lateral sliding resistance of 6 kPa (130 lb/ft^2) by the contact area. Use the lesser of the lateral sliding resistance and one-half the dead load.
[8] Values estimated from following references: Langer *et al.* (1984), Parkash and Shama (1990), and Poulos *et al.* (1980).

LIMITATIONS/CONDITIONS

When this alternate standard is utilized, building plans and calculations showing the design loads shall be submitted for review in accordance with ss. Comm 61.30 and 61.31.

The Wisconsin Building Alternate Standard Evaluation number is to accompany each plan submittal for projects that utilize this alternate standard.

The allowable increases set forth in footnote 4 of Table 1 for soil classes 3, 4, and 5 shall not exceed the following:

- Class 3 material: 6000 lb/ft^2 for firm soils and 4000 lb/ft^2 for loose soils
- Class 4 material: 4000 lb/ft^2 for firm soils and 2000 lb/ft^2 for loose soils
- Class 5 material: 2000 lb/ft^2 for medium soils and 1500 lb/ft^2 for soft soils

It is permitted to use the following vertical pressures in the absence of values given in Table 1.

- Class 3 material: 3000 lb/ft^2 for firm soils
- Class 4 material: 2000 lb/ft^2 for firm soils
- Class 5 material: 1500 lb/ft^2 for medium soils

The 20 percent increase allowed by footnote 4 of Table 1 shall be additive as follows: [i.e. a 2 foot wide foundation 4.5 feet deep would result in a multiplier of 1.9. {1.0 + 0.2((2' width – 1') + (4.5' depth – 1')) or 1.0 + 0.2 (1 +3.5)}. The increased vertical pressure values shall not exceed those listed previously under limitations/conditions.

Pursuant to s. Comm 61.61(7), the department may reexamine an approval and issue a revised approval at any time.

This approval will be valid through March 19, 2008, unless modifications are made to the alternate standard or a re-examination is deemed necessary by the department.

DISCLAIMER

This approval addresses only the specified applications for the alternate standard and does not waive any code requirement not specified in this document.

Approval Date: March 18, 2003. By: _____

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Program Manager
Safety and Buildings Division